



MINISTRY OF HEALTH MALAYSIA

NATIONAL INFLUENZA PANDEMIC PREPAREDNESS PLAN (NIPPP)

STRATEGIES

JANUARY 2006

FOREWORD

Asia has been the epicentre of some recent emerging infectious diseases. It was less than six months after the World Health Organisation declared that the last chain of transmission of severe acute respiratory syndrome (SARS) had been interrupted and the global outbreak contained that the unprecedented outbreak of highly pathogenic Avian Influenza (HPAI; H5N1) occurred in the region. Since this time, the world has moved closer to a pandemic Influenza than at any time since the last episode in 1968. All prerequisites for a start of a pandemic have now been met save one: the establishment of an efficient human-to-human transmission. During 2005, ominous changes have been observed in the epidemiology of the disease in animals. Human cases are continuing to occur and the virus has expanded its geographical range to include new countries, thus increasing the population at risk. Each new human infection gives the virus an opportunity to evolve towards a fully transmissible pandemic strain. The SARS events revealed how much the world has changed in terms of the impact that outbreaks can have in a highly mobile and closely interconnected world. Malaysia has had our share of major viral outbreaks. Since our experience with the Nipah outbreak in 1999, we have put in place processes to be better prepared to meet these challenges. As a consequence, we were better prepared during the SARS outbreak and the recent episode of HPAI outbreak in 2004. Malaysia was not a SARS affected country and is currently free from HPAI.

Certainly swift, coordinated action among government and non-government agencies, and first responders guided by a detailed plan that everybody can work from is one of the prerequisites in mitigating any outbreak. The challenge that we face is extraordinary and the importance of national, regional and global partnerships cannot be overstated if we hope to minimize the impact on health and economic development as well as prevent the international spread of infectious diseases

We have intensified our collaboration between our health and the agricultural sectors. The formation of an Inter-Ministerial Committee chaired by me and the Minister of Agriculture is testimony to our commitment and political support at the highest level. It is in line with the agreement achieved during the recent International meeting of Health Ministers on Global Pandemic Influenza Readiness in Ottawa, Canada in October 2005.

This interim document on the **National Preparedness Plans for Pandemic Influenza** is indeed timely and it is my hope that it will serve as a resource for pandemic preparedness stake-holders engagement and intensification of pre-existing core capacities to enable a quick response to pre-empt the pandemic or minimise its adverse impact.

THE HONOURABLE MINISTER OF HEALTH
DATO' DR CHUA SOI LEK

MESSAGE

There is a growing concern regarding the potential and the imminent threat of an influenza pandemic which could have the most devastating consequences. The Ministry of Health, the largest healthcare provider in Malaysia has taken the lead in developing a workable preparedness plan which is comprehensive yet multi-sectoral in nature. This plan called the **National Influenza Pandemic Preparedness Plan (NIPPP)** is a document which serves as a time bound guide for preparedness and response plan for influenza pandemic. It provides a policy and strategic framework for a multi-sectoral response and contains specific advice and actions to be undertaken by the Ministry of Health at the different levels, other governmental departments and agencies and non governmental organizations to ensure that resources are mobilized and used most efficiently before, during and after an Influenza pandemic episode.

It is also a roadmap whereby our core capacities can be strengthened for effective preparedness planning, prevention, prompt detection, characterization containment and control of emerging infectious diseases in general which threatens not only our national but also regional and international security.

This document will facilitate coordination among various sectors, particularly in this case, those dealing with human and animal health.

In its preparation, we have looked at several steps including the following:

- Situational analysis, current capacities, risk assessment and risk communication
- Strategies, activities and multi-sectoral cooperation mechanisms as well as allocation of responsibilities
- Time frame for emergency response and budget requirements
- Agreements on policies and priorities
- Challenges and opportunities
- Ways of monitoring and evaluating progress.

This Interim document has been prepared by the **National Pandemic Influenza Preparedness Planning Committee (NIPPPC)** and represents a broad consensus among the committee which is chaired by the Director General of Health and comprise of core multidisciplinary and inter-agencies/departmental representatives and experts, with respect to the action plans to be undertaken to ensure multi-sectoral response in the event an Influenza pandemic occurrence

This document is intended to be a working manuscript which will be tested on the ground and will be continually reviewed and updated as more information and new consensus are unveiled. It is also an advocacy tool for encouraging greater political commitment and promotes public reassurance that the Ministry of Health is fully dedicated and committed to protecting the Malaysian population from the threat of infectious diseases

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ABBREVIATION

AEHO	Assistant Environment Health Officer	MISS	Malaysia Influenza Surveillance System
ARDS	Acute Respiratory Distress Syndrome	MOH	Ministry of Health
ARI	Acute respiratory infection	NIC	National Influenza Centre
CD	Communicable Disease	NIL	National Influenza Laboratory
CSF	Cerebro-spinal fluid	NIIPC	National Inter-ministerial Influenza Pandemic Committee
DCD	Disease Control Division	NIPC	National Influenza Pandemic Committee
DDGH	Deputy Director-General of Health	NIPPC	National Influenza Pandemic Preparedness Committee
DMOH	District Medical Officer of Health	NIPPP	National Influenza Pandemic Preparedness Plan
DPH	Department of Public Health	NOR	National Operations Room
FMS	Family Medicine Specialist	NPHL	National Public Health Laboratory
GP	General practitioner	NSC	National Security Council
HC	Health Clinic	OPD	Outpatient Department
HCWs	Health care workers	OR	Operations Room
HECC	Health Education and Communication Centre	PCR	Polymerase Chain Reaction
HKL	Hospital Kuala Lumpur	PH	Public Health
HMIS	Health Management and Information System	PI	Pandemic influenza
HUSM	Hospital Universiti Sains Malaysia	PCID	Prevention And Control of Infectious Diseases Act
HUKM	Hospital Universiti Kebangsaan Malaysia	PHL	Public Health Laboratory
ID	Infectious Disease	PPE	Personnel Protective Equipment
IDRC	Infectious Disease Research Centre	UMMC	University Malaya Medical Centre
IHM	Institute of Health Management	VTM	Viral transport media
ILI	Influenza-like illness	VRI	Veterinary Research Institute
IMR	Institute for Medical Research	WHO	World Health Organisation
SSC	State Security Council	DSC	District Security Council
SARS	Severe Acute Respiratory Syndrome	OIE	World Organization for Animal Health

1.0 BACKGROUND

1.1 GLOBAL OVERVIEW OF INFLUENZA

Overview of the Global Status of Influenza

The epidemic of influenza that occurred every year were the results of the mutations in the genome of influenza A H1 and H3 viruses which primarily human pathogens. These epidemics killed almost 0.5 million people annually in the developed world alone. Though the figures from developing countries were not available because of inadequate surveillance and diagnostic facilities, these are believed to be substantial.

In temperate or colder climatic countries, seasonal influenza epidemics especially during the winter months are common occurrences in all age groups. In most individuals, influenza is a self-limited illness with the majority requiring only ambulatory medical care and those with complications needing hospitalization. The risk of developing serious complications resulting even in fatality is elevated in the very young and the elderly population and in those with underlying medical conditions.

Typical primary influenza illness lasts about a week and is characterized by abrupt onset of fever, muscle aches, sore throat, and non productive cough. In some persons, severe malaise and cough can persist for several days or weeks. Influenza infection not only causes primary illness but also can lead to severe secondary medical complications, including influenza viral pneumonia, secondary bacterial pneumonia, worsening of underlying medical conditions, such as congestive heart failure, asthma, or diabetes or other complications such as otitis media in children

Few other infectious diseases have adversely affected the health and economics of global populations like influenza did during the three pandemics in the 20th century as well as during the seasonal epidemics. Malaysia being in the tropics has been spared the catastrophe of severe influenza epidemics. But the next global pandemic of a very virulent influenza novel virus combined with the speed of communication & travel may reach our shores faster than we can anticipate causing an epidemic in our country; unless we are prepared to be vigilant in dealing with the disease.

There are three main types of influenza viruses; viz. A, B and C. Influenza C causes only mild disease and has not been associated with widespread outbreaks. Influenza types A and B, however, cause epidemics nearly every year. Influenza A viruses are divided into subtypes, based on differences in two surface proteins: haemagglutinin (H) and neuraminidase (N). Influenza B viruses are not divided into subtypes.

One of the most important features about influenza viruses is that their structure changes slightly but frequently over time - a process known as “drift”, and that this process results in the appearance of different strains that circulate each year. During influenza flu season especially in the winters in both the northern and southern hemispheres, usually one or more known influenza A subtype or B viruses circulate at the same time. The severity of the seasonal epidemic in any locality may be related to a drift in the previously circulating viruses.

Antigenic Drift vs. Antigenic Shift

Influenza viruses continuously undergo small genetic changes (referred to as antigenic drift) that require development of new influenza vaccines from year to year. Partial immunologic cross-reactivity between new strains and those they are replacing (i.e. homosubtypic immunity) limits morbidity, mortality, and spread in the population. Relatively few lineages of influenza A are circulating among humans at any one time, which reduces the likelihood of significant genetic re-assortments.

By contrast to the more gradual process of drift, in some years, the influenza virus changes dramatically and unexpectedly through a process known as “shift”. This is when an influenza A (not B) virus makes a dramatic change and acquires a new H or H+N surface proteins. This shift results in the appearance of a new or “novel” influenza virus that has never previously infected human or has not infected humans for a long time for which the general population is unlikely to have any immunity or antibodies to protect them against the novel virus. Influenza pandemics result when strains undergo a more dramatic genetic change caused by genetic re-assortment, generally between human and animal strains (referred to as antigenic shift). The appearance of a novel virus is the first step toward a pandemic. However, the novel influenza A virus also must spread easily from person to person (and cause serious disease) for a pandemic to occur and have potentially devastating impact. Influenza B viruses do not undergo shift and do not cause influenza epidemics. Therefore, an influenza pandemic may be defined by the emergence of a novel influenza virus, to which much or all of the population is susceptible, that is efficiently transmitted person-to-person, and causes disease outbreaks in multiple countries.

Antigenic shift in the influenza virus could create a novel subtype with virulence of in this case, H5N1 virus. Event of the past two years indicated the possibility of such a pandemic. It was estimated that should such pandemic strike, 6”– 28 million people will require hospitalization and 2 – 7 million would die. The pandemic would spread across the globe, within a few weeks, and could manifest in several ways.

The reservoir for Type A influenza viruses is wild birds but influenza A viruses also infect animals such as pigs, horses, poultry as well as people. The last two pandemic viruses were combinations of bird and human influenza viruses. Many persons believe that these new viruses emerged when an intermediate host, such a pig, was infected by both human and bird influenza A viruses at the same time.

Events in Hong Kong in 1997, however, showed that this is not the only way that humans can become infected with a novel virus. Sometimes, an avian influenza virus can “jump the species barrier” and move directly from chickens to humans and cause disease.

1.2 INFLUENZA IN MALAYSIA

In tropical countries like Malaysia influenza occurs all the year round with peak viral activity during the dry season from April to June, and the wet season from October to January. Seasonal outbreaks of influenza occur against a background of almost year-round transmission. The dry-season peak in infection is the most pronounced and corresponds with the warmest period of the year when the temperature ranges from 26.4°C to 28.4°C and humidity reaches 79% to 89%. The second peak, in the wet season, occurs during the coolest period when temperatures drops to between 24.8°C and 26.6°C and humidity ranges from 83% to 91%.

Prior to 1997, three major influenza outbreaks were recorded. These involved the influenza A virus H2N2 strain (May 1957), the H3N2 strain (August 1968), and the H1N1 strain (1980). The outbreak in 1980 was the first time the influenza A H1N1 strain was documented as the causative agent in a case of influenza like illness

Between 2003 until 2005, 6 influenza outbreaks have been documented from West Malaysia involving mainly residential schools. Four of the outbreaks were caused by Influenza A (H3 N2) virus and one by Influenza B virus

Influenza Virus Surveillance

Influenza virus surveillance first began in Malaysia in 1954. Participants include Government outpatient clinics and private clinics, as well as student clinics. A study conducted from September 1997 to April 1998 found that even though the influenza virus circulated throughout the year, a higher incidence of influenza A and influenza B infection occurred from October to December and March to April respectively (Figure 1). Most positive specimens were obtained from children less than 10 years of age.

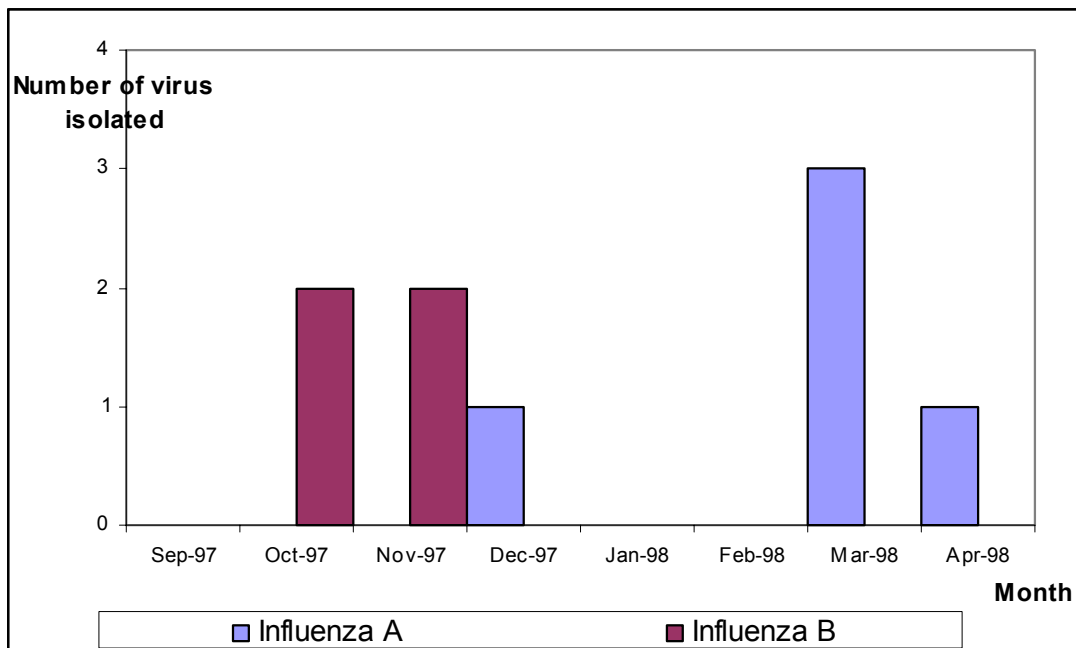


Figure 1: Influenza viruses isolated; monthly distribution from September 1997 to April 1998.

Source: Virology Unit, Infectious Diseases Research Centre Institute for Medical Research, Malaysia.

The Tables 1 illustrates Malaysian influenza virus surveillance data collected between 1997 until 2005.

Table 1: Influenza Surveillance in Malaysia, 1997-2001

Year	Number of Samples	Influenza Virus Isolated		Total Number of Influenza Virus-Positive Specimens
		Type A	Type B	
1997	165	1 H ₃ N ₁ (A/Sydney/5/97)	4 (B/Beijing/184/93)	5
1998	180	3 H ₃ N ₁ (A/Sydney/5/97)	9 (B/Beijing/184/93)	12
1999	210	5 H ₃ N ₁ (A/Sydney/5/97)	10 (B/Beijing/184/93)	15
2000	220	2 H ₃ N ₁ (A/Moscow/10/99)	0	11 (9 not recovered)
2001	690	18 H ₁ N ₁ (A/New Caledonia/20/99)	4 (B/Sichuan/379/99)	22
2002	414	9 H ₃ N ₂ (A/Moscow/10/99)	6 (B/Hong Kong/361/2002)	16
2003	999	7 H ₃ N ₂ (A/Moscow/10/99)	12 (B/Sichuan/379)	63
		29 H ₃ N ₂ (A/Fujian/411/2002)		
		9 H ₁ N ₁ (A/ New Caledonia/20/99)		
2004	2639	15 H ₃ N ₂ (A/Fujian/411/2002)	33 (B/Shanghai/361/2002)	182)
		13 H ₃ N ₂ (A/Wellington/1/2004)	6 (B/Hong Kong/330/2001)	
		5 H ₁ N ₁ (A/New Caledonia/20/99)	4 not recovered	
		2 H ₃ N ₂ (A/California/7/2004)	34 pending	
		14 not recovered 56 pending		
2005	844	2 H ₁ N ₁ (A/New Caledonia/20/99)	1 (B/Shanghai/361/2002)	140
		6 H ₃ N ₂ (A/Wellington/1/2004)	31 (B/Hong Kong/330/2001)	
		9 H ₃ N ₂ (A/California/7/2004)	14 not recovered,	
		4 not recovered, 49 pending	24 pending	

Source: Virology Unit, Infectious Diseases Research Centre Institute of Medical Research, Malaysia.

Malaysian influenza surveillance from 1997 to 2005 showed that more influenza viruses are isolated from March to April, June to July and October to November than other periods of the year (Figure 2). The incidence of influenza virus infection is typically higher during March and July than during other months of the year. In 2001, however, an atypical increase in the number of influenza cases occurred during November.

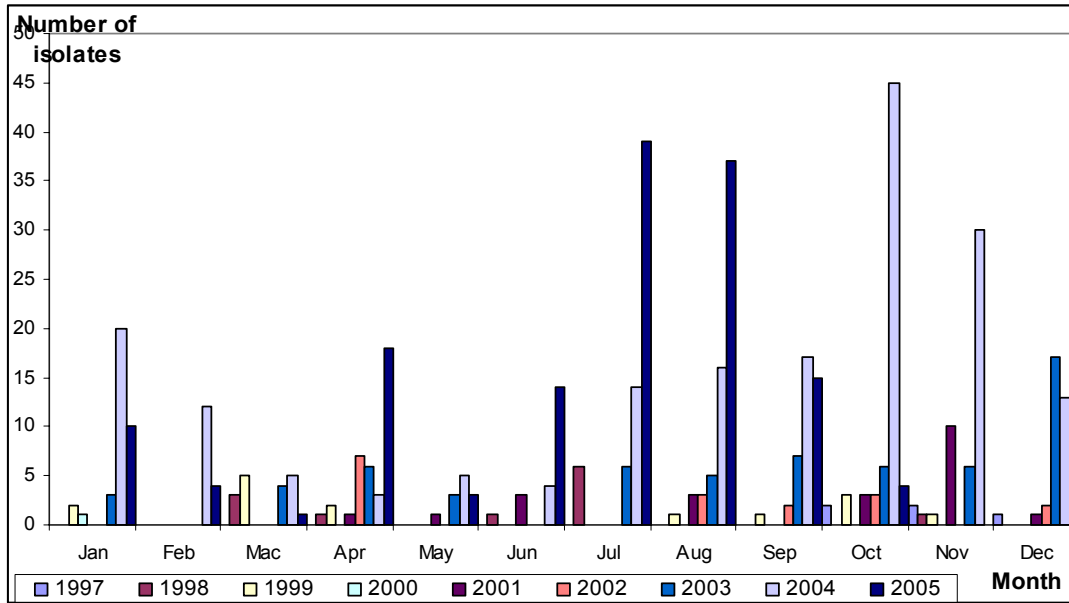


Figure 2: Pattern of influenza virus infections: monthly distribution, 1997 - 2005

Source: Virology Unit, Infectious Diseases Research Centre, Institute for Medical Research, Malaysia.

The pattern of respiratory infection caused by other respiratory viruses followed a similar monthly distribution with a higher incidence from March to May and July to October (Figure 3).

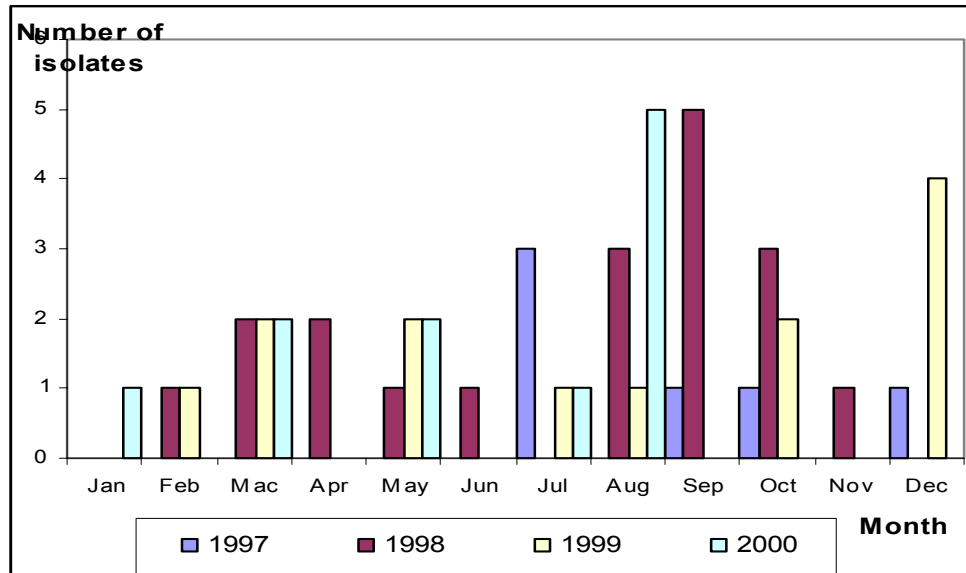


Figure 3: Pattern of respiratory infections due to other respiratory viruses: monthly distribution, January 1997 to August 2000

Source: Virology Unit , Infectious Diseases Research Centre Institute for Medical Research, Malaysia.

The seasonal occurrence of influenza cases for 1997 until 2005 mirrored the pattern seen in the southern hemisphere as a whole. Hence, it will be prudent to initiate a programme to increase the use of inter-pandemic influenza vaccine from the months of March/April utilizing the southern formulation.

1.3 CURRENT SITUATION OF AVIAN INFLUENZA OUTBREAKS

Of the avian influenza subtypes, currently the H5N1 subtype is of greatest pandemic concern for the following reasons:

- The virus has spread rapidly throughout poultry flocks in Asia over the past 2 years and now appears to be endemic in eastern Asia. In October 2005, H5N1 was identified in Turkey, Romania, and Croatia.
- The subtype mutates rapidly. It has shown a propensity to acquire genes from viruses infecting other animal species. It causes severe disease in humans, with a high case-fatality rate (reportedly at about 70%, although adequate surveillance data are lacking to accurately define the rate). The potential of exposure and infection of humans is likely to be ongoing in rural Asia, where many households keep free-ranging poultry flocks for income and food.
- Since January 2002, the predominant avian H5N1 strain in southern China has been genotype Z. Since its emergence, this strain has replaced other genotypes and has become the predominant genotype circulating in aquatic and terrestrial poultry in the region. This strain circulating in Asia appears to be highly pathogenic for humans, and immunity in the human population is generally lacking. However, the strain has not yet been shown to be easily transmitted between humans, and sustained person-to-person transmission has not occurred. Re-assortment with human strain(s) would be necessary for the current virus to acquire this attribute.
- If H5N1 continues to circulate widely among poultry, the potential for emergence of a pandemic strain remains high. For example, H5N1 viruses have been found in pigs in southern China, and human H3N2 influenza viruses are endemic in pigs in that area. H5N1 has recently been reported in pigs in Indonesia as well. Thus, the conditions exist for exchange of genetic material between the different viruses in the pig host. Some scientists believe that re-assortment between an avian and a human strain could occur in the human population without an intermediary host; if this proves true, as more humans become exposed and infected, the potential for re-assortment with a human strain may also increase. It is also possible that a pandemic strain could emerge following a more gradual process of adaptive mutation.
- The world is already in a phase of “pandemic alert” in which limited or no human transmission is recorded. Human cases of H5N1 have been reported in Vietnam, Thailand, Cambodia, Indonesia, and China. WHO has officially recognized 131 cases, 68 of them fatal, as of November 24, 2005. One case of encephalitis in Vietnam was confirmed retrospectively as H5N1. To date, sustained person-to-person transmission has not been recognized, although probable person-to-person spread was identified in Thailand involving transmission from an ill child to her mother and aunt. Public health officials are closely monitoring the ongoing occurrence of H5N1 avian influenza in humans in Southeast Asia and watching for the emergence of a strain capable of causing sustained human-to-human transmission. In June 2005, however, an international team sent to Vietnam found no laboratory evidence that the

H5N1 strain is infecting humans with greater frequency or that human-to-human transmission is occurring; as of June 30, WHO has officially declared the pandemic potential as unchanged. The possibility of a pandemic was growing everyday. The entrenchment of the virus in poultry and occasional transmission to human beings has occurred in Asia. In all likelihood, Asia would be the epicenter of the pandemic.

THE MALAYSIAN EXPERIENCE

Before 17 August 2004 Malaysia was free of Highly Pathogenic Avian Influenza (HPAI) . The first outbreak that occurred on 17 August 2004 coincided with the beginning of the second wave of the outbreaks in the region. Following that, 8 more outbreaks occurred, the last outbreak being on 22 September 2004. In addition to these outbreaks, active surveillance conducted surrounding the infected area also detected HPAI virus from apparently healthy birds in 3 locations. All the outbreaks were due to HPAI virus sub-typed H5N1. Similarly, all the viruses detected from healthy birds were also HPAI virus sub-typed H5N1.

All outbreaks and HPAI virus detection were confined only in the state of Kelantan, involving 5 districts (from total districts of 10), namely; Tumpat, Pasir Mas, Kota Bharu, Bachok and Tanah Merah. The state is situated in the North East of the Peninsular Malaysia and bordering Thailand. Other states in Peninsular Malaysia as well as Sabah and Sarawak are, to date, free of HPAI outbreaks or HPAI infection.

In contrast to the situation in Thailand, Vietnam and Indonesia, the cases and mortality due to HPAI in Malaysia were considered significantly low. Total number of cases involved in the outbreaks was 106 with 101 deaths. The avian species affected in the outbreaks were village chickens, quails, and ducks. Both village chickens and ducks were raised in free range type of husbandry, while quails were caged on raised floors. All together there were 12 separate premises that were affected.

There have been no human HPAI cases reported in Malaysia. House to house surveillance was conducted by medical officers in the infected areas. Thorough medical examination was done to all suspect cases and those living in affected premises. Although the virus involved in outbreaks in Malaysia was similar to the virus causing outbreaks in Thailand and Vietnam, there was no spread to humans.

The outbreaks as well as the detection of the HPAI virus sub-typed 1 were duly reported to World Organization for Animal Health (OIE). The first report was sent on 18 August 2004 while the final report was sent on 3rd January 2005.

The outbreaks and infection were successfully eradicated by implementing stamping out strategy. The last culling and disinfection were completed on 22 November 2004. Since then no new infections or clinical cases were detected. Malaysia has been declared as a HPAI Free Country on 22 February 2005, in accordance with Article 2.7.12.2 of the Terrestrial Animal Health Code.

1.4 THE PANDEMIC THREAT

A pandemic is a global disease outbreak. An influenza pandemic occurs when a new influenza A virus emerges for which there is little or no immunity in the human population, begins to cause serious illness and then spreads easily person-to-person worldwide. Three such pandemics have occurred in the last century; in 1918, 1957, and 1968 each causing millions of deaths. Each of these pandemics was preceded by development of a new virus through re-assortment of the human and animal influenza virus genes.

1918: Spanish Flu

The Spanish Influenza (H1N1) pandemic is the catastrophe against which all modern pandemics are measured. It is estimated that approximately 20 to 40 percent of the worldwide population became ill and that over 40 million people died. One of the most unusual aspects of the Spanish flu was its ability to kill young adults. The reasons for this remain uncertain. With the Spanish flu, mortality rates were high among healthy adults as well as the usual high-risk groups. The attack rate and mortality was highest among adults 20 to 50 years old. The severity of that virus has not been seen again.

1957: Asian Flu

In February 1957, the Asian influenza (H2N2) pandemic was first identified in the Far East. Immunity to this strain was rare in people less than 65 years of age, and a pandemic was predicted. In preparation, vaccine production began in late May 1957, and health officials increased surveillance for influenza outbreaks.

Unlike the virus that caused the 1918 pandemic, the 1957 pandemic virus was quickly identified, due to advances in scientific technology. Vaccine was available in limited supply by August 1957. Although the Asian influenza pandemic was not as devastating as the Spanish one, there were at least 70,000 U.S. deaths and 1-2 million deaths worldwide.

1968: Hong Kong Flu

In early 1968, the Hong Kong influenza (H3N2) pandemic was first detected in Hong Kong. The number of death for this pandemic was 34,000 in the U.S. and 700,000 deaths worldwide which was less than half of the deaths in USA during the Asian flu pandemic, making it the mildest pandemic in the 20th century.

There could be several reasons why fewer people died due to this virus. First, the Hong Kong flu virus was similar in some ways to the Asian flu virus that circulated between 1957 and 1968. Earlier infections by the Asian flu virus might have provided some immunity against the Hong Kong flu virus that may have helped to reduce the severity of illness during the Hong Kong pandemic. Also, improved medical care and antibiotics that are more effective for secondary bacterial infections were available for those who became ill thus reducing the fatality.

1.5 WHY ARE WE CONCERNED NOW?

Each century has witnessed an average of three pandemics of influenza occurring at intervals ranging from 10 to 50 years, starting without warning and spreading rapidly worldwide causing illness in more than 25% of the total population, with an estimated 40-50 million deaths within a year. Most deaths occurred in young and healthy persons in the age range of 15 to 35 years. Pandemic of 1957 and 1968 respectively were caused by the milder viruses, each killed 1-4 million people.

There is concern now because:

- Of the three pre-requisites to start an influenza pandemic viz.(i) emergence of a novel virus to which all are susceptible, (ii) new virus is able to replicate and cause diseases in humans, (iii) new virus is transmitted efficiently from human-to-human, the first two have already been met by the current H5N1 outbreaks in Asia.
- H5N1 virus, the potential candidate for the next pandemic, has not yet acquired the ability for efficient human-to-human transmission. If this happens, all conditions for a pandemic will be fulfilled.
- H5N1 virus is gradually expanding the host range (e.g. domestic, wild and migratory birds) and spreading geographically in the affected countries as well as to other countries.
- Although no one can predict with certainty when the pandemic will occur, experts warn that it is imminent; there is a great possibility that it would begin from Asia.
- During the current H5N1 outbreaks more than 150 million birds have been destroyed or died and the direct economic costs to affected countries were to the tune of \$ 8-12 billion.
- The next pandemic may cause very high morbidity and mortality in a few weeks. It is estimated that the pandemic may cause more than 1 billion cases and 2-7 million deaths. It may severely strain the health services and other essential services and cause massive social, political and economic disruption.
- A modest pandemic lasting over one year might cause losses as high as 3% of Asia's GDP and 0.5% of world GDP. This is presently equivalent to about a loss of \$ 150-200 billion in GDP.

Countries with pandemic preparedness and pre-existing core capacities will be able to respond quickly to pre-empt the pandemic or minimize its adverse impact.

1.6 THE IMPACT OF PANDEMIC INFLUENZA

- Pandemics are unpredictable and highly variable in terms of severity mortality and patterns of spread
- Most pandemics have originated in Asia. An exponential increase in the number and geographic spread can occur in a matter of weeks
- Virological surveillance for changes in the virus and surveillance among humans for respiratory illness are crucial as early warning systems
- Some public health interventions (quarantine, travel restrictions) have delayed the spread but could not stop it; nevertheless delay of spread is important to allow for medical services to develop a vaccine
- Vaccines have a significant impact but global manufacturing capacity is limited and takes too long (at least 4-6 months after the pandemic starts)

The severity of the next pandemic cannot be predicted, but modelling studies suggest that the impact of a pandemic on the United States could be substantial. In the absence of any control measures (vaccination or drugs), it has been estimated that in the United States a “medium-level” pandemic could cause 89,000 to 207,000 deaths, 314,000 and 734,000 hospitalizations, 18 to 42 million outpatient visits, and another 20 to 47 million people being sick. Between 15% and 35% of the U.S. population could be affected by an influenza pandemic, and the economic impact could range between \$71.3 and \$166.5 billion.

Influenza pandemics are different from many of the threats for which public health and health-care systems are currently planning:

- A pandemic will last much longer than most public health emergencies and may include “waves” of influenza activity separated by months (in 20th century pandemics, a second wave of influenza activity occurred 3 to 12 months after the first wave).
- The numbers of health-care workers and first responders available to work can be expected to be reduced. They will be at high risk of illness through exposure in the community and in health-care settings, and some may have to miss work to care for ill family members.
- Resources in many locations could be limited, depending on the severity and spread of an influenza pandemic.

Because of these differences and the expected size of an influenza pandemic, it is important to plan preparedness activities that will permit a prompt and effective public health response

1.7 CHARACTERISTICS AND CHALLENGES OF A PANDEMIC

1. Rapid Worldwide Spread

- When a pandemic influenza virus emerges, its global spread is considered inevitable.
- Preparedness activities should assume that the entire world population would be susceptible.
- Countries might, through measures such as border closures and travel restrictions, delay arrival of the virus, but cannot stop it.

2. Health Care Systems Overloaded

- Most people have little or no immunity to a pandemic virus. Infection and illness rates soar. A substantial percentage of the world's population will require some form of medical care.
- Nations unlikely to have the staff, facilities, equipment and hospital beds needed to cope with large numbers of people who suddenly fall ill.
- Inadequate supplies antiviral drugs, the two most important medical interventions for reducing illness and deaths, are of particular concern.
- Death rates are high, largely determined by four factors: the number of people who become infected, the virulence of the virus, the underlying characteristics and vulnerability of affected populations and the effectiveness of preventive measures
- Past pandemics have spread globally in two and sometimes three waves.

3. Medical Supplies Inadequate

- The need for vaccine is likely to outstrip supply.
- The need for antiviral drugs is also likely to be inadequate early in a pandemic.
- A pandemic can create a shortage of hospital beds, ventilators and other supplies. Surge capacity at non-traditional sites such as schools may be created to cope with demand
- Difficult decisions will need to be made regarding who gets antiviral drugs and vaccines.

4. Economic and Social Disruption

- Travel bans, closings of schools and businesses and cancellations of events could have major impact on communities and citizens.
- Care for sick family members and fear of exposure can result in significant worker absenteeism.

1.8 COMMUNICATIONS AND INFORMATION ARE CRITICAL COMPONENTS OF PANDEMIC RESPONSE

Education and outreach are critical to preparing for a pandemic. Understanding what a pandemic is, what needs to be done at all levels to prepare for pandemic influenza, and what could happen during a pandemic helps us make informed decisions both as individuals and as a nation. Should a pandemic occur the public must be able to depend on its government to provide scientifically sound public health information quickly, openly and dependably.

1.9 STEPS IN PREPARATION OF PANDEMIC PREPAREDNESS PLANS

- Situation analysis, risk assessment
- Current capacity of various sectors, especially health and veterinary services, to respond
- Agreement on policy and priorities
- Selecting strategies, activities and multisectorial cooperation mechanism
- Setting time frame for emergency response and allocating responsibilities
- Estimating budget requirements
- Identifying ways of monitoring and evaluating progress

2.0 THE NATIONAL INFLUENZA PANDEMIC PREPAREDNESS PLAN (NIPPP)

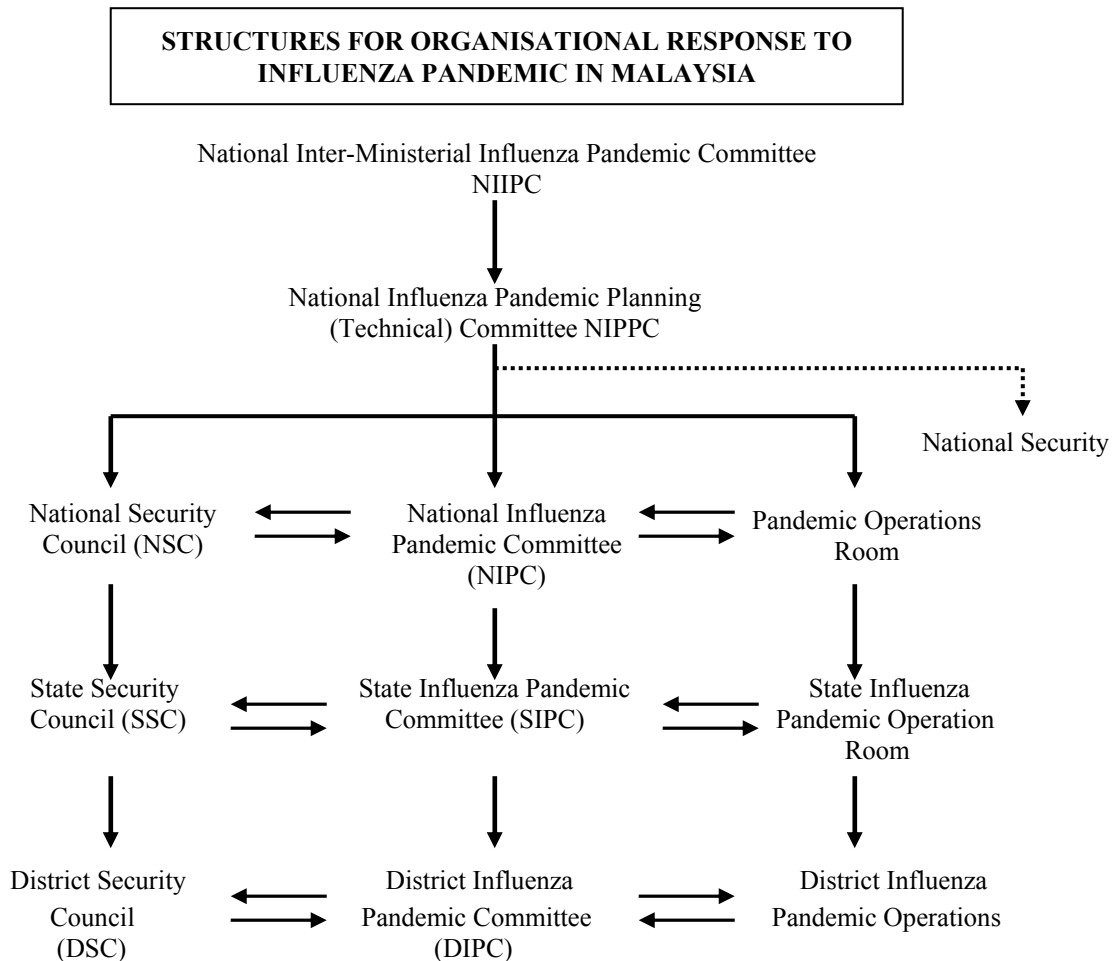
2.1 PURPOSE

The purpose of NIPPP is to facilitate an organised, coordinated and effective national preparedness and response in the event of an influenza pandemic. The plan provides a framework for preparedness based on national priorities and response by the health sector. This is to ensure rapid, timely, coordinated intersectoral and interagency actions in reducing the morbidity, mortality, social and economic disruption of a pandemic event

2.2 OBJECTIVES:

The NIPPP is a document which serves as a time bound guide for preparedness and response plan for influenza pandemic. It contains specific advice and actions to be undertaken by the Ministry of Health at the different levels, other governmental departments and agencies and non governmental organizations to ensure that resources are mobilized and used most efficiently.

2.3 ORGANISATIONAL RESPONSE TO INFLUENZA PANDEMIC



2.3.1 THE NATIONAL INTER-MINISTERIAL INFLUENZA PANDEMIC COMMITTEE (NIIPC)

This will provide policy directions and co-ordination of ministries and departments, governmental and non-governmental agencies relevant for controlling the pandemic in the country. It is answerable to the Cabinet on all matters related to the pandemic.

Composition of NIIPC

1. Minister of Health – Chairman
2. Secretary-General Ministry of Health - Secretary
3. Secretary-General Ministry of Home Affairs
4. Secretary-General Ministry of Internal Security
5. Secretary-General Ministry of Foreign Affairs
6. Secretary-General Ministry of Transport
7. Secretary-General Ministry of Information
8. Secretary-General Ministry of Tourism
9. Secretary-General Ministry of Education
10. Secretary-General Ministry of Higher Education
11. Secretary-General Ministry of Women, Family and Community Affairs
12. Secretary-General Ministry of Rural Development
13. Secretary-General of Defense
14. Secretary-General of Ministry of Trade and Import
15. Director-General of Health
16. Director-General Department of Immigration
17. Director-General Department of Occupational Safety and Health
18. Director-General of Veterinary Services
19. Inspector-General of Police
20. President Malaysian Medical Association
21. President Association of Private Hospital, Malaysia

Terms of Reference of NIIPC

1. Be responsible for the formulation, approval and implementation of all decisions of the Cabinet related to the prevention and control of the influenza pandemic.
2. Make decisions on all actions needed to ensure effective surveillance, prevention and control of the pandemic and associated research activities pertaining to it
3. Coordinate all activities of the various ministries and agencies relevant to the prevention and control of the pandemic
4. Be responsible for decision making on all influenza pandemic related issues
5. Determine the role and scope of activities of the various ministries and agencies in the pandemic

6. Be responsible for reporting to Cabinet on the status of the pandemic and the overall implementation of the recommendations made by the committee

In the event that the Cabinet appoints the Deputy Prime Minister as the Chairman of NIIPC, Ministers of the respective ministries represented in the NIIPC will be members

2.3.2 NATIONAL INFLUENZA PANDEMIC PLANNING COMMITTEE (NIPPC).

The NIPPC is the technical and advisory committee for the MOH and the National Inter-ministerial Influenza Pandemic Committee and will oversee the development and implementation of the NIPPP. It is responsible for developing strategies appropriate to the country's needs and situations drawing expertise from the WHO, international and local multidisciplinary experts. In the event of a pandemic MOH will be the lead agency for the country with technical inputs from NIPPC.

Composition of NIPPC

NIPPC comprises of core multidisciplinary and inter-agencies/departmental representatives and experts, with additional invited and co-opted members based on their particular expertise as and when required.

The members of NIPPC are as follows;

1. Director-General of Health - (Chairman)
2. Deputy Director-General of Health (Public Health)
3. Deputy Director-General of Health (Medical)
4. Deputy Director-General of Health (Research and Technical Support)
5. Director Disease Control, Ministry of Health - (Secretary)
6. Chief Infectious Disease Physician, Hospital Kuala Lumpur (HKL)
7. Director and Senior Consultant Virologist, National Institute for Natural Products, Vaccines and Biologicals
8. Head of Virology, National Influenza Centre
9. Director of National Public Laboratory, Sg. Buloh
10. Director of Veterinary Research Institute (VRI), Ipoh
11. Director-General, Department of Veterinary Services
12. Director of Pharmaceutical Services, Ministry of Health
13. President of Malaysian Medical Association (MMA)
14. President of Association of Private Hospitals Malaysia
15. Director-General of Health Services, Ministry of Defense
16. Director-General of Higher Education (representative)
17. Director of National Security Division, Prime Minister's Department

Terms of reference of NIPPC

1. To draft a document called the National Pandemic Influenza Preparedness Plan (NIPPP) which outlines an overall contingency plans for preparedness and response to an Influenza pandemic.
2. To oversee the further development and implementation of the NIPPP.
 - i. to provide guidance for state and district health levels in the development of state & district pandemic influenza preparedness & response plans.
 - ii. to provide optimal medical care and support maintenance of essential services.
3. To develop country specific public & professional awareness & educational programmes on influenza.
4. To ensure strengthening of influenza surveillance mechanisms in the country in order to provide an early warning and on-going monitoring during a pandemic.
5. To facilitate the timely access to, supply and delivery of influenza vaccines and antiviral drugs during a pandemic.
6. To make specific recommendations and strategies for influenza immunization for the high risk groups and those in the essential services.
7. To provide recommendation for antiviral drug therapy & prophylaxis & to avoid inappropriate use of them.
8. To communicate effectively with the public, health care providers, health professionals, stakeholders, community leaders and the media.
9. To regularly evaluate and update the contents of the plan to reflect new knowledge and advances gained from experiences from other countries.
10. To assess the potential impact from a pandemic virus and benefits from different approaches to disease prevention and control and case management.
11. To review and recommend legislations needed to handle a pandemic before and during its occurrence.
12. To put in place processes for risk communications.

2.3.3 THE INFLUENZA PANDEMIC COMMITTEES

In the event of influenza pandemic being declared by WHO, the influenza pandemic committees at all levels are activated and will respond by putting into action the influenza pandemic action plans for their respective levels, taking directions from the NIIPC and NIPPPC. These influenza pandemic committees are mainly responsible for the overall management of the influenza pandemic and are responsible for implementing the influenza pandemic action plans.

Role and functions of the Influenza Pandemic Committees

The role and functions of Influenza Pandemic Committees are as following:

1. to coordinate and implement the influenza pandemic action plans.
2. to reduce morbidity, mortality and hospital admissions from influenza.
3. to cope if necessary with large numbers of people who are ill and dying, both in the community and in hospitals.
4. to ensure that essential health services and other services are maintained and to reduce the disruption of normal daily life.

Composition of the influenza pandemic committees at the various level is as follows:

National Influenza Pandemic Committee (NIPC)

1. Deputy Director-General of Health (Public Health) – Chairman
2. Director of Disease Control – alternate Chairman
3. Director of Medical Development Division
4. Director of IMR
5. Director of IDRC, IMR
6. Director of Engineering Services
7. Director of Pharmaceutical Services
8. Director of Public Health Laboratory, Sg. Buloh
9. Director of Veterinary Services
10. Chief Consultant Physician HKL
11. Chief Consultant Paediatrician, Paediatric Institute HKL
12. Head Department of Pathology, HKL
13. Head of Virology Unit, IMR
14. Director Health Education and Communication Centre (HECC)
15. Deputy Director Communicable Disease (CD)
16. Deputy Director CD Surveillance - Secretary

State Influenza Pandemic Committee

1. State Secretary– Chairman
2. State Director of Health – Secretary
3. Royal Malaysian Police
4. Ministry of Education
5. State Director of Veterinary Services
6. State Representative of Association of Private Hospitals Malaysia
7. State Representative of MMA branch
8. Deputy Director of Health (Public Health)

9. Deputy Director of Health (Medical)
10. Deputy Director of Health (Pharmacy)
11. Deputy Director of Administration
12. State Epidemiologist
13. State Consultant Physician
14. State Consultant Paediatrician
15. State Health Education Officer
16. State ID Physician
17. State Chief Pathologist
18. State Matron
19. Chief Assistant Environmental Health Officer (APHI)

District Influenza Pandemic Committee

1. District Officer - Chairman
2. District Medical Officer of Health - Secretary
3. District Epidemiologist
2. Director of District Hospital
3. District Senior Assistant Environmental Health Officer (APHI)
4. Chief Physician, District Hospital
5. Chief Paediatrician, District Hospital
6. Chief Pathologist District Hospital

The roles and functions of each ministry, departments, agency and non-governmental organisations (NGOs) are shown in Appendix 1.

3.0 CURRENT CAPACITY FOR PANDEMIC INFLUENZA PREPAREDNESS

3.1 SURVEILLANCE

An effective national surveillance system is an essential component of an influenza pandemic preparedness and response. It aims to provide timely information to public health departments, health care providers and the general public about levels of influenza activity and circulating influenza virus strains. During times of an alert or an occurring pandemic, it is essential for detecting the introduction and spread of new strains to allow for planning and implementing control measures and for the allocation of resources.

The objectives of the national influenza surveillance system must be able to:

- detect increased influenza activities, either epidemic or pandemic through:
 - (a) detection of influenza-like illness (ILI) in the community using sentinel general/primary medical practices,
 - (b) the use of laboratory confirmation of influenza infection to estimate the proportion of these cases that are due to influenza
 - (c) viral isolation to confirm the diagnosis and to provide strains for antigenic analysis in WHO Influenza Reference Laboratory for vaccine formulation and to detect new strains
- rapidly detect and confirm any cases due to potential or actual pandemic strains known to be present overseas, as identified by WHO or other suitable sources including strains found in animal populations that may pose a threat to humans
- detect and identify in a timely manner new strains that arise in Malaysia
- enhance the level of surveillance if a pandemic strain is identified outside and inside Malaysia

All components of the surveillance systems need to be operational during the inter-pandemic period, albeit at a lower level but will be enhanced during each of the pandemic phases.

Malaysia has several surveillance systems for monitoring influenza which have linkages to WHO FluNet and other agencies like the Veterinary Services Department. Currently the systems comprise the following:

International surveillance – WHO FluNet

There is currently a worldwide surveillance system for influenza coordinated by the WHO. This system makes it possible for changes in circulating influenza viruses and the emergence of novel influenza A viruses to be detected as early as possible. The task of identifying circulating strains of influenza whether known or novel is done by a worldwide network of 110 National Influenza Centres (NIC) and many other WHO laboratories in 83 countries. The four international WHO Collaborating Reference Centres for Influenza in London, Atlanta, Melbourne and Tokyo coordinate the system and actively analyse samples of virus isolated and collected by the 180 or so laboratories in the network worldwide.

The Virology Unit within the Infectious Diseases Research Centre (IDRC) of the Institute for Medical Research (IMR) and the Department of Microbiology, Faculty of Medicine, University of Malaya, Kuala Lumpur are designated by WHO as NILs and are part of the worldwide network of laboratories doing international surveillance for influenza viruses.

Sentinel surveillance.

Sentinel surveillance (clinical) of influenza like illness (ILI) was started in September 2003 to record the daily number of consultations that fit the case definition of an ILI from selected GP clinics and MOH outpatient clinics in the country and to report the number weekly from district to State and monthly from State to the National level. The details of the sentinel surveillance for influenza-like illnesses are as per Clinical & Laboratory Surveillance of Influenza in Malaysia (MISS) document.

Laboratory based surveillance.

Laboratory based surveillance (virological) of the Influenza virus has been in existence since 1954, involving localized studies by the Virology Unit within the Infectious Diseases Research Centre (IDRC) of the Institute for Medical Research (IMR) and in the seventies, by the Department of Microbiology, Faculty of Medicine, University of Malaya.

A more systematic laboratory based surveillance system for the influenza virus was piloted by IDRC, IMR in the states of Kelantan, Penang, Selangor and Johore (from sentinel sites) in 2003. This surveillance system was extended to cover the whole country in 2005. Clinical specimens are collected from patients with ILI from selected sentinel sites across the country. These specimens are sent by the sentinel sites to the respective regional laboratories for influenza testing. The report of viruses' isolation and surveillance data is sent regularly to the Surveillance Section MOH for analysis & epidemiological linkages to the clinical surveillance data. The guidelines on the laboratory based surveillance system for influenza is now incorporated into a new guidelines entitled "Clinical and laboratory surveillance of Influenza in Malaysia".

Serological surveillance for influenza.

This is done when indicated through surveys of stratified population groups.

Surveillance of mortality due to influenza and related respiratory conditions (Pneumonia) - hospital based surveillance

Surveillance of deaths from influenza and related respiratory conditions (pneumonia) from hospital medical records in MOH hospitals could be developed into a hospital based surveillance system for influenza as well. The data from the Health Management Information System (HMIS) Medical Subsystem can be collated and sent from hospitals weekly to health departments for analysis and a report is sent monthly to MOH.

Animal influenza surveillance

This is being carried out by the Veterinary Research Institute and the Veterinary Services Department and the information so derived from the surveillance is shared with MOH.

3.2 RISK COMMUNICATION

Effective health communication including risk communication during outbreaks is vital and a communication strategy has to be developed specifically for responding to an influenza pandemic. An influenza pandemic will affect very large numbers of people and not only those normally considered to be in a high-risk group. There will be concern and confusion amongst the general public regardless of whatever plans made by MOH. In order to minimise panic and alarm, the public must be kept well informed with factual and up to date information. Likewise, for the health professionals there is a need for an intensive information campaign to enable them to play an effective role in responding to the pandemic. Features of effective communication should include the following:

- i. Obtaining regular and up-to-date information from the respective NIPC so as to be able to inform the public about the current situation of the pandemic.
- ii. Implementing communications strategy and rapid dissemination of information to the public at all levels. The health messages should be packaged in such a way (including use of vernacular languages) to reach different target groups of the population in a timely manner according to the phases of the pandemic in order to be effective.
- iii. Preparing fact sheets and health education materials before pandemic occurs for the general public.
- iv. Utilizing existing health channels such as website of the MOH to disseminate information more widely to health professional and the general public.
- v. Providing avenues for public to submit inquiries and receive personalized and customized answer such telephone, hotlines and emails.
- vi. Provide timely surveillance update and advice to health professional and the public through MOH, DPH website; [http:// dph.gov.my/survelans/](http://dph.gov.my/survelans/)
- vii. Disseminating health messages through mass media intensively and extensively to ensure all segments are informed and empowered to take priority actions.
- viii. Appointing appropriate spokespersons at national level to conduct regular press conference / release to inform about the latest situation of the pandemic.

3.3 PUBLIC HEALTH RESPONSE

Prevention

Prevention begins with early detection of changes in influenza viruses and rapid development of effective vaccines to defend against influenza each year and responding to the possibility of a pandemic strain if warranted. The circle of surveillance and vaccines formulation is a never ending process to prevent a

pandemic. Antiviral drugs are now available for the circulating strains of influenza in the world and are also being researched to ensure that we have antiviral drugs capable of preventing or curing the infection.

Surveillance

Prevention, therefore, begins with effective surveillance for any emergence of a new or novel strain of the influenza virus. WHO global network for surveillance of influenza as well as the individual country surveillance will enable WHO to take prevention steps early in the onset when a new strain is being introduced into the world.

Control Measures to prevent spread of pandemic

It is unlikely that the spread of influenza pandemic can be halted easily but options to prevent its entry into the country firstly or when transmission first occurs in the country, slowing down transmission should be the aim to reduce and distribute the demand on the health services over a longer time period during a pandemic and to increase the opportunity of protecting people through immunization when vaccines are made available. Control measures that could be undertaken are the following:

i. Travel Advisories

Sick people with influenza symptoms should not travel out of the any country having a pandemic. Contacts should be advised to defer traveling to unaffected areas. The public should be advised against any unnecessary travel during pandemic, more especially so, to pandemic countries.

ii. Entry points screening of travelers

Entry points screening of travelers from pandemic countries into the country may be considered to prevent entry of the pandemic virus into the country. This has been done during the SARS outbreak and the guidelines are modified for influenza pandemic.

However, the recent WHO consultation on priority public health interventions held in Geneva 16-18 March 2004 stated such entry screening lacked proven health benefits and the practice should be permitted (for political reasons, to promote public confidence) but not encouraged. Travelers should receive health alert notices instead.

iii. Exit Screening for all travelers from affected areas

Exit screening for all travelers from areas with human infection through either use of health declaration or thermal scanning may be more feasible than entry screening for detecting early cases to prevent spread. Health declaration form may also be used for those developing signs and symptoms while on board planes/ships before their entry into Malaysia.

iv. Screening of passengers on-board aircraft for pandemic influenza

It has been noted that the spread of influenza cases from the countries with local transmission to other parts of the world involved air travel.

v. Isolation and Quarantine

All suspected cases will be isolated and their contacts placed under home surveillance for a period of double the incubation period (10 days). All probable cases should also be isolated and their contacts placed under quarantine at home. Voluntary home confinement of symptomatic persons may also be carried out.

This control measure may be necessary to prevent the importation of pandemic influenza into the country by travelers coming into Malaysia from PI affected countries or areas, i.e. during Phase 2 onwards; but when the influenza pandemic becomes widespread in the country, this strict control measures of isolation and quarantine of contacts may not be efficient or effective. NIPCC will review and decide accordingly.

vi. Self-health monitoring and reporting if ill

Self-health monitoring at home or in workplace and reporting if ill are control measures that can be implemented by the population if guidelines on how to do it are given. This will become important especially to those returning or coming in from affected countries. When the pandemic becomes established in the country and the numbers of cases and contacts are large, self-monitoring at home and contacting the call centre for advice if ill or on whether there is a need for care in a health facility may be feasible to limit transmission.

vii. Hand hygiene and disinfection

Strict hand hygiene or washing should be the norm of the day and should be widely emphasised to healthcare professionals and members of the public. Household and health facilities disinfection of potentially contaminated surfaces are other useful control measures.

viii. Use of face masks

Guidelines on use of appropriate face masks and types of face masks should also be widely disseminated and observed for occupational risk groups and the general public. Generally, surgical masks will suffice to prevent transmission. Patients may need to use face masks when moved from one place to another within a health facility.

ix. Closures and Cancellations

Temporary closures of schools, swimming pools, public places etc may be instituted as the needs arise. Cancellation of public gatherings or events may become necessary to reduce risks of transmission when pandemic influenza has spread to the country to prevent widespread transmission. Administrative closures or cancellations may need to be backed up by necessary legislation under the current law or modifications be made if needed.

x. Case investigations and contact tracing

Case investigations are very important to determine the mode or changes in the mode of transmission of the disease as well as to monitor the risk factors and spread of the disease. Contact tracing and follow-up of contacts in the early alert pandemic/early pandemic phases may help to prevent transmission. It will be not be feasible once the pandemic is widespread.

xi. Information Dissemination

All public health control measures to prevent spread of the pandemic have to be widely disseminated in order to get the full cooperation of the general public and also health care providers and professionals.

3.4 MEDICAL RESPONSE

Access to and provision of quality medical care are among the most important strategies to decrease morbidity and mortality during a pandemic, particularly the period before vaccine becomes available. The demand of the medical or clinical services will be overwhelming during a pandemic. Higher disease rates are likely to stress outpatient and inpatient care further, and this situation is likely to be exacerbated by high rates of absenteeism among health care workers who are likely to be at increased risk of exposure and illness or who have to care for ill family members during a pandemic. In addition to managing infections in the community, it will be important to control the spread of infection among vulnerable populations in hospitals and long-term care facilities such as nursing homes.

Due to expected high rates of infection during pandemic influenza, all, except the seriously ill will need to be cared for at home or institutions outside of hospitals or health facilities. At the same time during the early introduction of the infection into the country, all probable or suspected cases will need to be isolated in designated hospitals to prevent spread. The clinical or medical response has to be flexible enough to accommodate the ever changing situations from the alert of the novel virus & the resultant pandemic outside of Malaysia, the entry of the virus into the country (see the Phases for influenza pandemic in Malaysia) and the progression of disease during the pandemic if not completely controlled. The clinical response will have to include the following:

i. Clinical Case Definitions of Pandemic Influenza

The clinical case definition should be used by medical practitioners to diagnose influenza as well as for by isolation and laboratory testing for confirmation.

ii. Notification or Prompt Reporting of Cases

Cases diagnosed should be notified promptly according to the guidelines given by the Ministry of Health to the relevant health authority. Real time reporting of cases may become necessary when the pandemic occurs.

iii. Triaging and Initial Assessment of Cases for Influenza

Triaging guidelines to help health care workers identify influenza patients who present to the health clinics, doctors' clinics, emergency rooms or any other triaging centres in hospitals should be used for the initial assessment of such patients for influenza.

iv. Clinical Management of Cases

A guideline of clinical management of cases by doctors in outpatient and hospital settings will contribute towards effective management of patients and help identify early pandemic cases and prevent spread. Treatment of cases should follow the guidelines laid down including the use of antiviral drugs.

Hospital Admission Policies

Depending on the phases of the pandemic, the admission policies for cases may vary from one of admitting all probable or suspected cases to one of only the very ill or with complications. In the early phases of the pandemic to prevent importation into or to reduce transmission of the virus in the country, all suspect or probable influenza cases will be admitted in designated hospitals and kept in isolation as done during the SARS crisis.

When the number of cases has gone beyond the capacity of health facilities to cope with, with a full blown outbreak in the country a policy of surveillance and treatment at home or the use of non-traditional health facilities may be instituted. Hospital admissions will only be for those with respiratory distress or with associated complications of influenza or those in the high risk group (i.e. those with co-morbidities) coming down with influenza. Such **admission policies should be clearly defined and will need to be updated as the pandemic evolves.**

Triage and infection control in health facilities

Triage and strict infection control guidelines similar to those during the SARS outbreak are to be implemented in all health facilities and are especially important in hospitals where patients are treated. Isolation of patients and their subsequent management should adhere strictly to level of infection control needed to handle such cases. MOH guidelines "Policy and Procedure of Infection and Disinfection and Sterilization, 4th Edition 2002" (droplet transmission) should be followed by individuals in all health facilities both in the private and public sectors to prevent transmission of influenza infection.

The use of recommended personal protective equipments by health care workers and the importance of hand hygiene should be strictly enforced to prevent staff from being infected. Health care workers should be educated regarding such appropriate infection control practices, to prevent spread of influenza and guidelines should be strictly enforced. Prioritization of critical staff for preventive interventions when vaccine is made available or prophylactic use of antivirals should be considered to assure continued operations of the health facilities.

Resource Management for Health care Facilities

During an influenza pandemic, the demand on health care services provided at health care facilities can be expected to increase, peak and decline during the weeks in which any one location is affected. There is a need for resource management in terms of increased bed capacity, patient prioritization of usage of health care facilities, provision of care outside of traditional hospitals, critical equipments and supplies, drugs and allocations and use of volunteers and voluntary organizations like Red Cressent, St. Johns Ambulance etc., to help meet the demands of the pandemic. There is also the issue of human resource management in terms of optimal use of health care workers, designated staff for influenza case management, deployment of health care workers (HCWs), provision of training, immunization and care and support for HCWs.

Staff welfare

Adequate provision for staff welfare and wellbeing during the pandemic is important to ensure there is enough staff looking after patients. Guidelines on prophylactic treatment of staff having symptoms or the like and the prioritization of staff for vaccination when vaccines are made available need to be planned for and made available for implementation when indicated. A surveillance system to detect early staff coming down with influenza should be followed.

Antiviral drugs

The objectives in the planning of the uses of antiviral drugs are:

1. to recommend a strategy for the use of antivirals during a pandemic
2. to address issues around the availability, procurement and supply of these antivirals.
3. to monitor drug resistance during the pandemic
4. to facilitate & ensure the distribution of available antiviral drugs to appropriate groups of people during the pandemic.

Antiviral drugs are available for both prevention and treatment of influenza. Currently there are two classes of drugs – amantadines and neuraminidase inhibitors. To prevent influenza illness, antiviral drug must be taken consistently before infections occur. As treatment to reduce the impact of influenza for someone who is already infected, the drugs must be taken within two days after flu symptoms start. It is important to know that antiviral drugs can have some potentially serious side effects too. The Ministry of Health will be stockpiling neuraminidase inhibitors ie. oseltamivir and zanamivir.

Vaccines

Malaysia does not have the capacity to manufacture vaccines. As vaccines production is subject to several rate-limiting steps; the first, supplies of vaccines against a novel strain of influenza are unlikely to be available for at least six months. Global demand will be high and supplies will be limited during a pandemic. Identification of priority groups for immunization is to be done before vaccines are made available. The logistics of supply and distribution of vaccines must be planned before hand.

The recommendation of priority groups of populations for vaccination during Influenza pandemic may be revised by NIPPC when new epidemiological data is available in the event of the occurrence of an influenza pandemic

3.5 LABORATORY RESPONSE

During the inter-pandemic period, WHO coordinates a program of international surveillance for influenza in humans, with assistance of four WHO Collaborating Centres (CCs). The Centres are based in Atlanta, USA; London UK; Melbourne, Australia and Tokyo, Japan. These Centres maintain repositories of different virus strains develop reagents and technologies for strain comparisons and train workers from National Laboratories. These Centres have bio-containment facilities which enable them to conduct studies with possible pandemic strains under conditions that do not pose safety risks or jeopardize the analyses.

The National Influenza Laboratories designated by WHO are the “front lines” of surveillance activities. The role and functions of laboratories in the global surveillance of influenza and also in our country are vital to prevent an influenza pandemic. As such, the strengthening of laboratory capability and capacity for infectious diseases cannot be overemphasized. The Virology Unit in the Infectious Diseases Research Centre of the Institute for Medical Research and the Medical Microbiology Department of the University of Malaya are National Influenza Laboratories and are part of the WHO global network of laboratories for influenza surveillance.

Currently the Virology Unit in the Infectious Diseases Research Centre of the Institute for Medical Research has been designated as the National Influenza Centre by the Ministry of Health.

National Influenza Centres (NICs) are the backbone of the WHO Global Influenza Surveillance Network (link). During the inter-pandemic period, every year NICs collect specimens, conduct preliminary analysis and ship representative isolates to WHO Collaborating Centres for Reference and Research on Influenza (WHOCCs) for advanced antigenic and genetic analysis, results of which form the basis of WHO annual vaccine composition recommendation for northern and southern hemispheres respectively.

The terms of reference and functions of the NIC are as follows:

Terms of Reference of NICs:

National Influenza Centres (NICs) are national institutions designated by national Ministries of Health and recognized by the World Health Organization (WHO) for the purpose of participating in the work of the WHO Global Influenza Programme. Upon such recognition by WHO, NICs become members of the WHO Global Influenza Surveillance Network.

In this capacity NICs will: in general

Serve as the key point of contact between the World Health Organization and the country of origin in all questions relating to virological and epidemiological surveillance of influenza and provision of influenza virus isolates to the WHO Global Influenza Surveillance Network.

Maintain active communication with the members of the WHO Global Influenza Surveillance Network through e.g. the timely submission of viruses, immediate information on isolation of unusual viruses or disease outbreaks, weekly reports on influenza activity during the influenza season and the provision of any other relevant information on influenza surveillance and control.

The laboratory based influenza surveillance

The laboratory influenza surveillance guideline has been reviewed in 2004 and incorporated in the overall document entitled the Malaysian Influenza Surveillance System (MISS).

The objectives of the laboratories are:

1. To provide laboratory diagnostic services for respiratory viruses especially influenza viruses
2. To carry out laboratory based surveillance of influenza virus activity in the country.
3. To provide an early warning system for emergence of new sub-type and/or re- emergence of previously known subtypes of influenza viruses.

The laboratory experts working group

This group comprising of laboratory experts including medical microbiologist and scientists is formed to review and update the existing laboratory action plan for influenza preparedness and response and will be also responsible to provide and review guidelines issued by it.

Laboratory Guidelines and Flow Charts

The laboratory guidelines and flow charts for clinical collection of specimens for influenza virology tests, the handling and transport of the specimens, receipt, processing and handling of specimens in the laboratory, reporting of result and laboratory bio safety.

3.6 OTHER ESSENTIAL SERVICES RESPONSE

Essential services such as the police, fire, transportation, communications and emergency management services need to be maintained during influenza pandemic. Other services and supplies including food, water, gas, and electricity supplies, educational facilities, postal and sanitation are also likely to be affected. Services need to be assessed regularly and support measures implemented promptly in response to most urgent need. Community support of NGOs, community leaders & public in general, is also needed to ensure their participation in the overall pandemic plan.

MOH is to initiate responses with other relevant governmental/non governmental departments/agencies in order to maintain these other essential services by having plans on how to protect the health of these services providers. This can be done by the NIIPC where other essential services ministries are represented in the control of the pandemic.

3.7 NATIONAL SECURITY COUNCIL (NSC) RESPONSE

The National Security Council at all levels should be alerted for co-ordination of all government and non-governmental agencies in dealing with the pandemic when it reaches a proportion outside the capability and capacity of the existing mechanisms to handle the pandemic. The Council at all levels will then be responsible for coordinating the overall incident management as well as non medical support and response actions across all federal departments & agencies at all levels.

The invoking of NSC *Arahan* 20 should be made on the recommendation by NIIPC to the Cabinet and the take over control of the emergency situation as a threat to the country's security resulting from an infectious disease will then be undertaken by the Security Councils at the national, state and district level.

The Ministry of Health will continue to play the role of the lead agency under the Security Council for the control of the influenza pandemic and will coordinate the overall public health and medical emergency responses across all federal departments & agencies at all levels.

3.8 PHARMACEUTICAL SERVICES RESPONSE

Vaccines and antiviral drugs supply

As Malaysia does not have the capacity to manufacture vaccines yet, a plan defining the logistics of how to obtain the newly manufactured available vaccines during the pandemic must be worked out with manufacturing companies in the world prior to the pandemic or with the help of the WHO.

Antiviral drugs must be adequately stocked and a plan for distribution made available when the need arises. Logistics of purchase of such drugs must be worked out with suppliers for MOH use as well as for the private health providers.

4.1 ACTIONS TAKEN BY THE WHO DURING PANDEMIC

1. WHO announces onset of the influenza pandemic
2. WHO makes recommendation for vaccines composition and organizes production and distribution
3. WHO issues guidance on best use of anti-viral drugs.
4. WHO will further enhance its monitoring and reporting of the global spread and impact of the virus.
5. WHO will seek help in mobilization of resources for countries with limited capacities
6. WHO will work with regional offices as appropriate to encourage common activities among nations facing similar challenges from the pandemic.

The WHO in 1999, defined six pandemic phases under which preparation and response can be organized. Most of the activities defined as preparedness would be done during the inter-pandemic period, Phase 1. Phases 2 to 6 are for activities when an outbreak of the novel influenza virus is confirmed leading to outbreaks in multi-countries (pandemic).

WHO will declare a pandemic alert of influenza when there is a person-to-person spread in the general population with a least one outbreak lasting for more than 2 weeks in that one country.

Before declaring a pandemic alert, WHO will convene an international task force to ensure that the assessment of the new virus's pandemic potential includes an assessment to determine whether the situation could represent either an unusual ecological situation of an animal vector spreading the virus to persons in different locations or whether it could represent bioterrorism.

4.2 LEVEL OF INFLUENZA PANDEMIC PHASES - ADAPTED FROM WHO AND SUMMARY OF STRATEGIC ACTIONS

Influenza Pandemic – Phases and Strategic Actions

	Phases	Transmission	Objectives	Strategic actions
Inter-pandemic period (planning and preparedness)	1	Interpandemic Period No new Influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human infection or disease is considered to be low	Strengthen pandemic preparedness at all levels	<ul style="list-style-type: none"> • Prepare Pandemic Preparedness Plan • Established surveillance in animal • Establish human influenza surveillance • Establish collaboration between human and animal sectors
	2	No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease	Minimise the risk of transmission to humans; Detect and report rapidly, if it occurs	<ul style="list-style-type: none"> • Enhance animal surveillance and aggressive response to animal outbreaks • Strengthen human surveillance • Stockpile antiviral, PPE etc • Strengthen collaboration between different sectors and WHO/OIE/FAO • Develop and implement risk communication strategy • Prepare health and essential service contingency plan
Pandemic Alert (emergency and pre-emptive response)	3	Pandemic Alert period Human infection(s) with a new subtype, but no human to human spread, or at most rare instances of spread to a close contact	<p>Ensure rapid characterization of new virus</p> <p>Detect, notify and respond to additional cases</p>	<ul style="list-style-type: none"> • Enhance animal surveillance and aggressive animal outbreak containment • Enhance human surveillance and aggressive outbreak management • Early strategic use of antivirals • Social distancing • Implement risk communication strategy • Issue alert for quick implementation of health and essential service contingency plan

	Phases	Transmission	Objectives	Strategic actions
	4	Small cluster(s) with limited human to human transmission but spread is highly localised, suggesting that the virus is not well adapted to humans.	Contain the virus or delay its spread	
	5	Larger cluster(s) but human to human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).	Maximum efforts to contain or delay the spread	
Pandemic (minimising impact)	6	Pandemic period Pandemic phase: increased and sustained transmission in general population	Minimize the impact of the pandemic	<ul style="list-style-type: none"> • Implement health and essential services contingency plan • Risk communication; • Treat case and contacts with antivirals, if available, • Social distancing: close schools, ban gatherings
Postpandemic period		Post pandemic period Return to interpandemic period.		

Note: explanation of the phases are as in Appendix 2.

5.0 CONCLUSION

This NIPPP provides guidance for the preparedness and response needed in facing the threat of an influenza pandemic. This plan is dynamic and there is an on-going process of updating the contents of the plan as and when required to reflect new knowledge and experiences gained and advances made by experts the world over. The State and District should have their own detailed plan of action using this document as guidance.

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**ROLES & FUNCTIONS OF OTHER MINISTRIES, DEPARTMENTS AND
NON-GOVERNMENTAL ORGANISATIONS DURING INFLUENZA PANDEMIC**

i. Ministry of Home Affairs

- a. To ensure co-ordination in issues related to security and public order on the influenza pandemic.
- b. To give advice on security issues related to the influenza pandemic.
- c. To provide security cover, if needed during enforcement of PCID Act 1998.
- d. To facilitate all matters pertaining to security and public order e.g. spreading of rumours, related to the influenza pandemic.

ii. Ministry of Foreign Affairs

- a. To help in all matters on international relations pertaining to the influenza pandemic.
- b. To obtain information on the latest situation and updated development on the influenza pandemic in the affected countries.
- c. To facilitate all matters pertaining to conduct of foreign relations related to the control of the influenza pandemic.

iii. Ministry of Transport

- a. To ensure compliance of all control measures on the influenza pandemic agreed upon regarding public transportation in and out of entry points in the country.
- b. To co-ordinate issues in the control of the influenza pandemic, related to the movement of public transportation and people.
- c. To facilitate all transportation issues related to the influenza pandemic.
- d. To ensure all passengers boarding airplanes from countries affected by the influenza pandemic to Malaysia have medical screening prior to departure, completed health declaration forms on board the planes before disembarking and isolation on board if the passenger is a suspected case of influenza.

iv. Ministry of Information.

- a. To disseminate relevant information to the community regarding the status of outbreak, and educational materials and public information on the influenza pandemic.
- b. To coordinate press conferences and all mass media activities on the influenza pandemic.
- c. To facilitate all matters as regards the print and electronic media related to SARS.

v. Ministry of National Unity and Community Development.

- a. To help in the influenza pandemic control measures by printing and disseminating information on the influenza pandemic.
- b. To implement and enforce preventive and control measures in all childcare centres under its jurisdiction.
- c. To coordinate all activities for the families related to influenza.
- d. To facilitate all matters concerning families and community related to Influenza

vi. Ministry of Education.

- a. To disseminate updated information on the control measures of the influenza pandemic to all teachers and students.
- b. To remind all students, their parents or guardians that students who are ill with symptoms and signs similar to Influenza to be examined and treated by doctors and not to allow them to attend school during the period of illness.
- c. To request parents or guardians to monitor the health status of their children and to refer to doctors if they are ill.
- d. To facilitate all measures on the prevention and control of Influenza at the school level and especially College and University levels where many foreign students come to study in the country.
- e. To help implement the screening of foreign students returning to Colleges and universities after their holidays from affected Influenza pandemic countries.

vii. Ministry of Rural Development

- a. To help disseminate information of the influenza pandemic to the rural communities.
- b. To facilitate all matters related to the influenza pandemic in the rural areas.
- c. To implement and enforce preventive and control measures in all child care centres under their charge.

viii. Ministry of Culture, Arts and Tourism.

- a. To help print and disseminate all official information issued by the Ministry of Health to all those related to the tourism industries.
- b. To help give feedbacks to the National Inter-ministerial Committee on Influenza pandemic on matters concerning tourism.
- c. To facilitate all matters on the influenza pandemic related to the tourism sector.

ix. Department of Immigration

- a. To facilitate in the screening processes of people / travelers at entry points into the country.
- b. To help coordinate all health influenza issues related to the movements of all aliens especially foreign workers into the country.
- c. To help identify ill individuals / travelers coming through immigration check points.
- d. To facilitate all matters on the influenza pandemic related to immigration.
- e. To be stringent in the issue of visa/temporary visa of travelers from the influenza pandemic affected countries.

x. Department of Occupational Safety and Health.

- a. To monitor the health of workers and to take remedial action to rectify if needed.
- b. To help print and distribute education materials on influenza pandemic and to advice on the risk factors in the work place and surroundings.
- c. To facilitate all matters concerning dangers of the work surroundings related to the spread of Influenza.

xi. Royal Malaysian Police.

- a. To ensure coordination of security and public order in the control of the influenza pandemic.
- a. To give advice on security matters pertaining to the influenza pandemic if any.
- b. To provide security cover, if needed, in the enforcement of PCIDA 1998.
- c. To facilitate all matters concerning security and public order if any pertaining to the influenza pandemic e.g. rumours mongering

xii. Association of Private Hospitals, Malaysia

- a. To disseminate all information regarding Influenza including the hospital management of Influenza to all members of the association.
- b. To coordinate all activities and measures on hospital infection control in private hospitals in dealing with infectious diseases.
- c. To quickly refer all suspected/probable Influenza patients to the nearest Influenza pandemic designated hospitals when indicated in the guidelines of MOH.

xiii. Primary Care Doctors Organization

- a. To help disseminate all information regarding Influenza and the pandemic to its members.
- b. To help teach the community who are ill to come for early treatment.
- c. To help detect early any person who may present with symptoms of Influenza for referral to designated hospitals when indicated by MOH guidelines
- d. To facilitate all matters pertaining to primary care on Influenza

xiv. Malaysian Medical Association

- a. To help disseminate all information regarding influenza pandemic to its members
- b. To help teach the community who are ill to come early for treatment.
- c. To help detect early any person who present symptoms of Influenza for referral to hospitals if needed.
- d. To facilitate all matters pertaining to the primary care of Influenza.

xv. Ministry of Defense

- a. To help disseminate all information regarding influenza pandemic
- b. To help detect early any person who present with symptoms of Influenza for referral to hospitals if needed.
- c. To facilitate all matters pertaining to the primary care of Influenza.
- d. To help detect early any person who may present with symptoms of Influenza for referral to designated hospitals when indicated by MOH guidelines

EXPLANATION OF THE PANDEMIC INFLUENZA PHASES

Interpandemic period

Phase 1

No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection or disease may or may not be present in animals. If present in animals, the risk of human infection or disease is considered to be low.

It is likely that influenza subtypes that have caused human infection and/or disease will always be present in wild birds or other animal species. Lack of recognized animal or human infections does not mean that no action is needed. Preparedness requires planning and action in advance.

Phase 2

No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease. The presence of animal infection caused by a virus of known human pathogenicity may pose a substantial risk to human health and justify public health measures to protect persons at risk.

Pandemic alert period

Phase 3

Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact. The occurrence of cases of human disease increases the chance that the virus may adapt or reassort to become transmissible from human to human, especially if coinciding with a seasonal outbreak of influenza. Measures are needed to detect and prevent spread of disease. Rare instances of transmission to a close contact may occur i.e. in a household or health-care setting, but do not alter the main attribute of this phase, i.e. that the virus is essentially not transmissible from human to human.

For examples;

- one or more unlinked human cases with a clear history of exposure to an animal source/ non-human source (with laboratory confirmation in a WHO-designated reference laboratory).
- Rare instances of spread from a case to close household or unprotected health-care contacts without evidence of sustained human-to-human transmission.
- One or more small independent clusters of human cases (such as family members) who may have acquired infection from a common source or the environment, but for whom human-to-human transmission cannot be excluded.
- Persons whose source of exposure cannot be determined, but are not associated with clusters or outbreaks of human cases.

Phase 4.

Small cluster(s) with limited human-to-human transmission but spread is highly localised, suggesting that the virus is not well adapted to humans. Virus has increased human-to-human transmissibility but is not well adapted to humans and remains highly localised, so that its spread may possibly be delayed or contained.

For examples;

- one or more clusters¹ involving a small number of human cases, e.g. a cluster of <25 cases lasting <2 weeks.
- Appearance of a small number of human cases in one or several geographically linked areas without a clear history of a non-human source of exposure, for which the most likely explanation is considered to be human-to-human transmission.

Phase 5.

Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk). Virus is more adapted to humans, and therefore more easily transmissible among humans. It spreads in larger clusters, but spread is localized. This is likely to be the last chance for massive coordinated global intervention, targeted to one or more foci, to delay or contain spread. In view of possible delays in documenting spread of infection during pandemic *phase 4*, it is anticipated that there would be a low threshold for progressing to *phase 5*.

For examples;

- ongoing cluster-related transmission, but total number of cases is not rapidly increasing, e.g. a cluster of 25–50 cases and lasting from 2 to 4 weeks.
- Ongoing transmission, but cases appear to be localised (remote village, university, military base, island).
- In a community known to have a cluster, appearance of a small number of cases whose source of exposure is not readily apparent (e.g. beginning of more extensive spread).
- Appearance of clusters caused by same or closely related virus strains in one or more geographical areas without rapidly increasing numbers of cases.

Pandemic period**Phase 6.**

Increased and sustained transmission in the general population. Major change in global surveillance and response strategy, since pandemic risk is imminent for all countries. The national response is determined primarily by the disease impact within the country.

Postpandemic period

A return to the interpandemic period (the expected levels of disease with a seasonal strain) follows, with continued need to maintain surveillance and regularly update planning. An intensive phase of recovery and evaluation may be required.

Glossary**New influenza virus subtype**

- a subtype that has not circulated in humans for at least several decades and to which the great majority of the human population therefore lacks immunity.

The distinction between

- *phase 1* and *phase 2* is based on the risk of human infection or disease resulting from circulating strains in animals. The distinction is based on various factors and their relative importance according to current scientific knowledge. Factors may include pathogenicity in animals and humans, occurrence in domesticated animals and livestock or only in wildlife, whether the virus is enzootic or epizootic, geographically localised or widespread, and/or other scientific parameters.
- *phase 3*, *phase 4* and *phase 5* is based on an assessment of the risk of a pandemic. Various factors and their relative importance according to current scientific knowledge may be considered. Factors may include rate of transmission, geographical location and spread, severity of illness, presence of genes from human strains (if derived from an animal strain), and/or other scientific parameters.